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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,854	09/02/2004	Michael Bock	BOS0067	4503

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Anthony Niewyk
Baker & Daniels
111 East Wayne Street
Suite 800
Fort Wayne, IN 46802

EXAMINER	
PILKINGTON, JAMES	

ART UNIT	PAPER NUMBER
3682	

MAIL DATE	DELIVERY MODE
09/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,854	BOCK ET AL.	
	Examiner	Art Unit	
	James Pilkington	3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Prosecution Application

The request filed on 8/24/07 for a Continued Examination (RCE) is accepted and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title; if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami et al, USP 6,550,567, in view of Fleytman, USP 6,098,480.

Murakami discloses a worm gear for a vehicle steering system comprising:

- A shaft (attached to worm gear 71) swivably mounted for swiveling in the radial direction (in the direction of Y)
- A worm (71) disposed in a rotationally fixed manner on said shaft (71 is part of shaft)
- A worm wheel (72) preloaded in the radial direction (meshing with teeth of worm causes some preloading)
- A housing (8)
- A fixed bearing (11)

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- A loose bearing (10, moves inside and relative to 22 via elastic members 20)
- A slot (81)
- A support ring (22), said loose bearing (10) bears against said housing (8) via said support ring (22, 20 connects the bearing to the ring, the ring connects to the housing)
- A spring element/anti-twist device (20, elastic member) disposed between the loose bearing and the housing (via the support ring 22). It is to noted that the spring and anti-twist device are the same device as disclosed by the applicant on pg 8 In 14 of the specification submitted on 11/4/04.
- The spring element is a plate spring (Fig. 8 shows the elastic member 20 as a plate spring), or a leaf spring (Fig. 5 shows the elastic member 20 as a leaf spring connected to the housing via the support ring)
- A motor (6)
- The worm (71) is cantilevered on the shaft (see Fig. 4)
- The shaft is mounted in the housing (8) by means of rolling bearings (fixed bearing 11)

Murakami does not disclose that the worm wheel has teeth that have different pressure angles on the left and the right so that the normal force between said worm and said worm wheel is independent of the direction of rotation of a torque exerted on said worm by said worm wheel.

Fleytman teaches a gear (34) that has teeth that have different pressure angles on the left and right (Φ_{g1} and Φ_{g2}) so that the normal force between said worm and said worm wheel is independent of the direction of rotation of a torque exerted on said worm by said worm wheel for the purpose of providing an assembly which has improved efficiency and component life, is quieter, has higher torque handling capacity, improved weight savings and packing, and reduces effect of shock loading (C2/L12-18).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Murakami and provide a gear that has teeth that have different pressure angles on the left and right so that the normal force between said worm and said worm wheel is independent of the direction of rotation of a torque exerted on said worm by said worm wheel, as taught by Fleytman, for the purpose of providing an assembly which has improved efficiency and component life, is quieter, has higher torque handling capacity, improved weight savings and packing, and reduces effect of shock loading.

3. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami '567 in view of Fleytman '480 and further in view of Lu et al, USP 6,046,560.

Murakami in view of Fleytman discloses all of the claimed subject matter as applied to clms 1-11 above and Murakami also discloses that the motor (6) has an output shaft (12).

Murakami in view of Fleytman does not disclose that the motor has three-phases and FET's are used to short-circuit at least two phases.

Lu teaches that a motor has three phases (Aa, Bb and Dd) and FET's (switches) are used to short-circuit the phase (turn the phases on and off C9/L39-C10/L12) for the purpose providing a motor that has the capability of adjusting current through the phase to assist in the steering of a vehicle (C10/L11-12).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Murakami in view of Fleytman and provide a motor has three phases and FET's are used to short-circuit the phase, as taught by Lu, for the purpose providing a motor that has the capability of adjusting current through the phase to assist in the steering of a vehicle.

Double Patenting

4. Claims 1-11 and 14 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,860,829 in view of U.S. Patent No. 6,098,480 to Fleytman. Claims 1-11 and 14 of USP 6,860,829 discloses a worm gear for a vehicle steering system which comprises a shaft, a worm, a worm wheel, a housing, a fixed bearing, a loose (moveable) bearing, a support ring, and a spring element. Claims 1-11 and 14 do not disclose that the worm wheel has teeth, each said tooth having right and left tooth flanks which are inclined at respective pressure angles that are different between the left and right flanks (Fleytman, Φ_{g1} and Φ_{g2}). In view of the teachings of Fleytman it would have been obvious to one having ordinary skill in the art to modify claims 1-11 and 14 of USP 6,860,829 and make the gear teeth with different pressure angles on the left and right side of the teeth, as taught by Fleytman, for the purpose of providing an assembly which has improved

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efficiency and component life, is quieter, has higher torque handling capacity, improved weight savings and packing, and reduces effect of shock loading (C2/L12-18).

Note: Re the phrase "adapted to" claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure. See MPEP 2106 and 2111.04

Response to Arguments

5. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Pilkington whose telephone number is (571) 272-5052. The examiner can normally be reached on Monday-Friday 8:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JP

8/28/07



RICHARD RIDLEY
SUPERVISORY PATENT EXAMINER